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ABSTRACT

This unit is designed to help high schools students to explore the relationship between U.S. foreign policy and the global environment. At the core of the unit is a framework of four distinct options that allows students to consider a range of alternatives for U.S. policy toward global environmental problems. Using this framework, students are compelled to ponder a wide variety of considerations that enter into the discussion of U.S. policy on this critical international issue. Background readings, written with the complexities of the debate on the environment in mind, are included. Part I briefly explains the causes and effects of the leading global environmental problems, while Part II discusses the environmental agenda of the international community and examines the connection between energy policy and the environment. The unit includes a five-day lesson plan and student activities. The lesson plan begins by introducing students to the policy dimension of recent findings about ozone depletion, then engages them in a role play based on the June 1992 Earth Summit in Rio de Janeiro. After weighing environmental issues in a global context, students evaluate U.S. options in the course of a two-day simulation. Finally, students apply what they have learned in developing their own option for U.S. policy. (DB)

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CHOICES FOR THE 21ST CENTURY

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Global Environmental Problems: Implications For U.S. Policy

SO 022 303

ALTERNATIVES FOR PUBLIC DEBATE AND POLICY DEVELOPMENT

A project of the Center for Foreign Policy Development

Brown University, Box 1948, Providence, RI 02912

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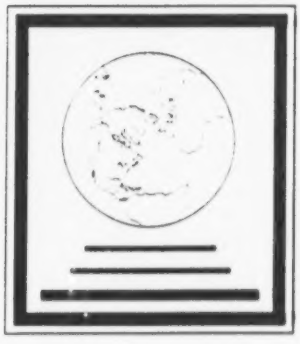

THE CHOICES FOR THE 21ST CENTURY EDUCATION PROJECT was established at the Center for Foreign Policy Development to help citizens think constructively about foreign policy issues, to improve participatory citizenship skills, and to encourage public judgment on policy priorities.

THE CENTER FOR FOREIGN POLICY DEVELOPMENT of the Thomas J. Watson Jr. Institute for International Studies at Brown University is a nonprofit research organization. Its mandate is to bring together scholars, policymakers, and the public in a search for policy choices that can lead to a consensus on U.S. national security and foreign policy.

The Study Circles Resource Center offers an edition of this material for adult study groups. To order, write: SCRC, Box 203, Pomfret, CT 06258.

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Note to Teachers

Until recently, concern about the environment was focused almost exclusively on local and national problems. The smog of Southern California, the pollution of the Great Lakes, and the nuclear accident at Three Mile Island dominated our thinking about environmental issues. However, many threats to the environment -- such as ozone depletion, global warming, and acid rain -- are increasingly recognized as problems that transcend national boundaries. As such, environmental concerns have emerged as a foreign policy question, closely linked to economic policy. With the United Nations Conference on Environment and Development scheduled to take place in Rio de Janeiro in June 1992, world leaders will be wrestling with these issues.

Although global environmental problems began to gain public attention in the 1980s, the concept that environmental problems are global is still in the process of definition. *Global Environmental Problems: Implications for U.S. Policy* explores the relationship between U.S. foreign policy and the health of the planet. With this unit, students will be grappling with the same tough questions that are confronting policymakers.

At the core of the unit is a framework of four distinct options that allows students to consider a range of alternatives for U.S. policy toward global environmental problems. Using this framework, students are compelled to ponder a wide variety of considerations that enter into the discussion of U.S. policy on this critical international issue. The background readings were written with the complexities of the debate on the environment in mind. Part I briefly explains the causes and effects of the leading global environmental problems, while Part II discusses the environmental agenda of the international community and examines the connection between energy policy and the environment.

Global Environmental Problems: Implications for U.S. Policy includes a five-day lesson plan and student activities. The lesson plan begins by introducing students to the policy dimension of recent findings about ozone depletion, then engages them in a role play based on the upcoming Earth Summit in Rio de Janeiro. After weighing environmental issues in a global context, students evaluate U.S. options in the course of a two-day simulation. Finally, students apply what they have learned in developing their own option for U.S. policy.

Below is an outline of the five-day lesson plan.

Day One: Ozone depletion and public policy
Homework: Read Part I of the background readings and complete "Study Guide -- Part I"

Day Two: Regional differences at the Earth Summit
Homework: Read Part II of the background readings and complete "Study Guide -- Part II"

Day Three: Role playing the four options: organization and preparation
Homework: Complete preparations for the simulation

Day Four: Role playing the four options: debate and discussion
Homework: Read the four options, then fill out "Focusing Your Thoughts" and complete "My Option Five"

Day Five: Looking into the future.

Note: This unit will be revised following the United Nations Conference on Environment and Development in Rio de Janeiro. The revised edition will be available in August 1992.

Part I: Global Environmental Problems

Our Planet and the Environment

A bustling steel mill in South Korea. Farmland newly cleared from the jungle in Brazil. A computer assembly plant in the United States. Together, these images suggest the technological progress that characterizes the modern world. Without question, the strides in industry and agriculture in the past century have been unparalleled in human history.

But look again. The advances that have brought new prosperity to much of the globe have come at a price. The smokestacks of the steel mill spew out pollutants that spread to other countries. The farm was carved out of rainforest that previously served as home for dozens of rare plants and animals. The computer plant relies on chemical cleaning agents that may threaten the atmosphere of the entire world.

In making use of the earth's resources, humanity has assumed a greater and greater role in shaping the planet's environment. In recent years, people around the world have come to recognize that the continued expansion of human activity has spawned a new set of problems that extends beyond national borders. In an increasingly interconnected world, global environmental problems have become a subject of concern for many Americans. These issues have taken a more prominent position on the international agenda since the end of the Cold War rivalry between the United States and the former Soviet Union. In fact, some experts predict that environmental issues will come to dominate international relations in the 21st century.

Global warming

Much of the current anxiety regarding environmental problems has revolved around global warming. Many scientists believe that man-made changes in the atmosphere over the last 200 years will produce a worldwide increase in temperatures during the 21st century.

The build-up of gases, such as carbon dioxide, methane, nitrogen oxides, chlorofluorocarbons (CFCs) and other trace gases, is thought to contribute to global warming. These gases are called greenhouse gases because they trap heat in the atmosphere in much the same way that a greenhouse prevents heat from escaping beyond its glass panels.

Carbon dioxide is the greenhouse gas that has received the most attention from scientists. Carbon dioxide is essential for life on earth. Plants require carbon dioxide for life just as animals need oxygen. Moreover, carbon dioxide absorbs much of the earth's infrared (long-wave) energy that would otherwise be radiated back into space. By absorbing this heat energy, carbon dioxide keeps the earth warm enough to support life.

Humanity, however, has added carbon dioxide to the atmosphere by burning fossil fuels -- oil, coal and natural gas. Fossil fuels were formed from plants and animals that lived millions of years ago. Over eons, this organic matter accumulated under the earth's crust and was transformed into fossil fuel by intense heat and pressure. Since the Industrial Revolution began late in the 18th century, much of the world has come to depend on fossil fuels. As a result, the amount of carbon dioxide in the atmosphere has increased by 25 percent.

In the last few years, scientists have begun to study the connection between fossil fuel emissions and the global environment. Many scientists predict that the build-up in carbon dioxide and other greenhouse gases will increase temperatures three to eight degrees Fahrenheit by the end of the next century.

If these predictions prove valid, dramatic changes could take place worldwide. Warmer temperatures, for example, would affect rainfall patterns and agricultural practices. Overall, precipitation would probably increase, but droughts could become more common in the Middle West and other areas far from water. Some of the world's best farmland might be lost, while latitudes in the far north could become more productive. Sudden climate change may also lead to the extinction of plant and animal species unable to adapt. Moreover, scientists fear that global warming would raise the level of the world's seas, as polar ice melts and additional heat causes water to expand. Nearly 20 percent of the world's people, as well as many of the planet's most fragile ecosystems, could be vulnerable to coastal flooding.

Within the scientific community, however, many experts continue to debate the likely extent and consequences of global warming. Some scientists contend that warming will take place at a slower rate

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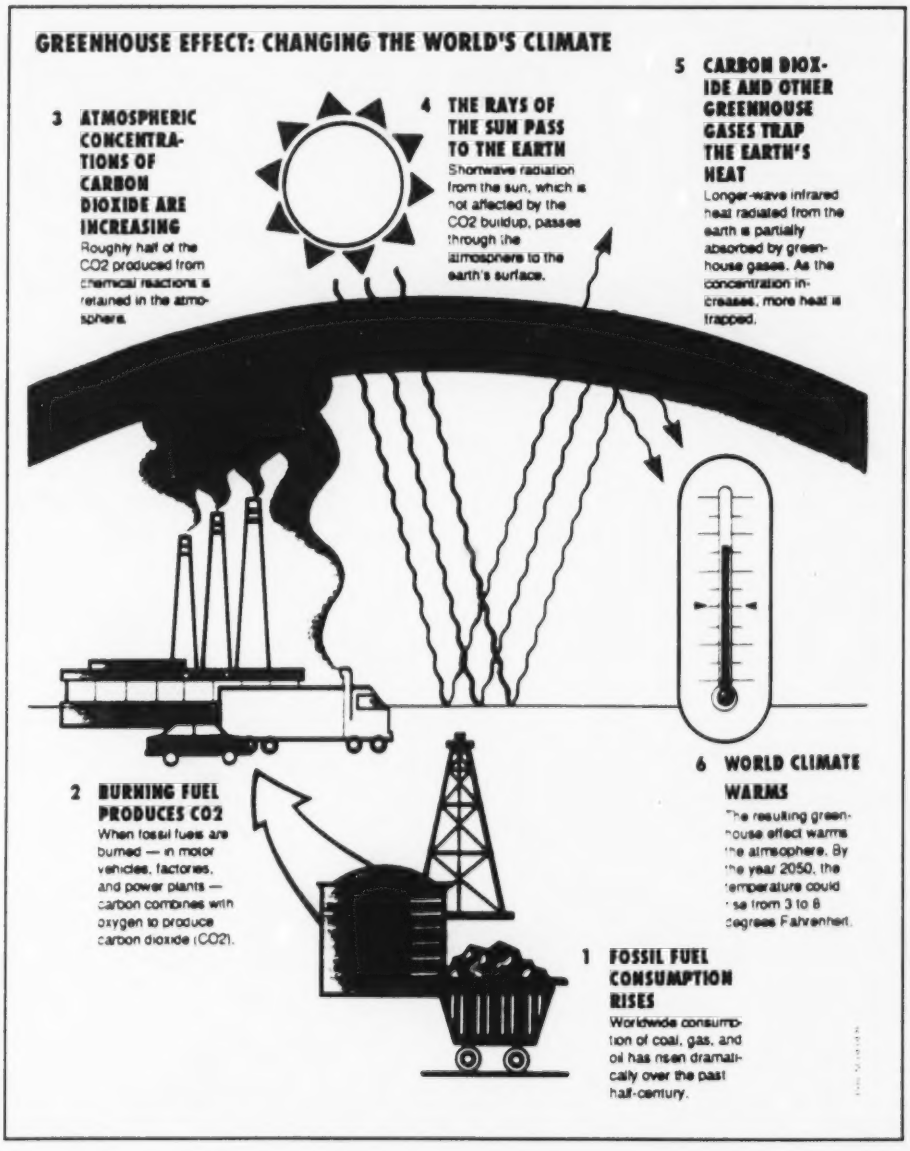
than anticipated and so will give humanity enough time to adjust. Others believe that the theory of global warming remains unproven. They emphasize that the global climate is influenced by many factors, and is more complex than the computer models used to predict future global temperatures.

Ozone depletion

Scientists have discovered that certain chemicals have damaged the ozone layer -- the atmospheric layer 10 to 25 miles above the earth that prevents much of the sun's ultraviolet (UV) radiation from reaching the surface of the planet. Although ozone in the lower atmosphere is a polluting greenhouse gas, ozone in the upper atmosphere benefits living organisms by blocking damaging sun rays.

Studies about the ozone layer in recent years have been especially alarming. In early 1992, scientists announced that the ozone layer over the northernmost areas of Canada, Europe, Russia, and the United States had undergone dramatic thinning. The data led many experts to predict that a hole in the ozone layer may open up over populated areas of the northern hemisphere as early as this spring and summer. Previously, concern about holes in the ozone layer had been focused mostly on the frozen wasteland of Antarctica.


GREENHOUSE EFFECT: CHANGING THE WORLD'S CLIMATE
3 ATMOSPHERIC CONCENTRATIONS OF CARBON DIOXIDE ARE INCREASING
Roughly half of the CO2 produced from chemical reactions is retained in the atmosphere.
4 THE RAYS OF THE SUN PASS TO THE EARTH
Shortwave radiation from the sun, which is not affected by the CO2 buildup, passes through the atmosphere to the earth's surface.
5 CARBON DIOXIDE AND OTHER GREENHOUSE GASES TRAP THE EARTH'S HEAT
Longer-wave infrared heat radiated from the earth is partially absorbed by greenhouse gases. As the concentration increases, more heat is trapped.
2 BURNING FUEL PRODUCES CO2
When fossil fuels are burned — in motor vehicles, factories, and power plants — carbon combines with oxygen to produce carbon dioxide (CO2).
6 WORLD CLIMATE WARMS
The resulting greenhouse effect warms the atmosphere. By the year 2050, the temperature could rise from 3 to 8 degrees Fahrenheit.
1 FOSSIL FUEL CONSUMPTION RISES
Worldwide consumption of coal, gas, and oil has risen dramatically over the past half-century.

Many scientists believe that the build-up of carbon dioxide in the atmosphere may lead to a rise in temperatures worldwide. This illustration of the greenhouse effect starts with number 1. (Reprinted with permission of the Public Agenda Foundation. Phil Scheuer, graphic artist.)

Chemicals containing chlorine and bromine have been linked to the destruction of the ozone layer. Most significant in the category of chlorine-producing chemicals are CFCs. CFCs are used in refrigeration, air conditioners, aerosols, foam insulation, upholstery and packing material. (They also contribute to global warming.) Other harmful chemicals are used in fire extinguishers and industrial solvents. Once these chemicals are released into the atmosphere, they slowly rise into the stratosphere and eat away at the ozone layer for about 100 years.

Ozone depletion may have serious consequences for human health, plants, and sea life. Greater exposure to

UV radiation would result in increased rates of skin cancer, cataracts, and immune system problems. Scientists predict that additional UV radiation would also reduce crop yields and harm phytoplankton, the first link in the aquatic food chain.

Unlike global warming, the causes and consequences of ozone depletion are relatively well-established. In response, most developed countries have agreed to phase out the use of ozone-destroying chemicals. Leading chemical manufacturers, such as DuPont and Allied Signal, have been attempting to develop substitutes. Companies that supply refrigeration, air conditioning and fast-food packaging have also been seeking new technologies.

Acid rain

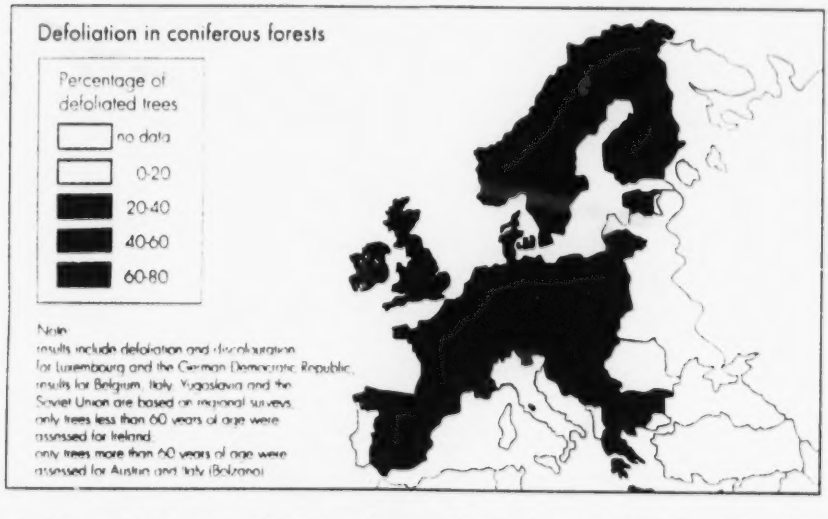
In the last two decades, scientists have come to understand that air pollution not only affects human health, but damages ecosystems on land and water as well. Particular attention has been paid to the effect of acid rain.

Acid rain results from the pollutants emitted in the combustion of fossil fuels, especially coal. The two leading agents of acid rain, sulfur and nitrogen oxides, are released by smokestacks, smelting plants, and automobiles. Once in the atmosphere, they are converted to acid, then they return to the earth's surface in the form of rain, snow, or fog, often hundreds of miles from their source.

In many developed countries, acid rain has damaged the ecosystems of lakes and rivers. Scandinavian countries, subjected to the pollution of both Great Britain and central Europe, have been particularly hard hit. An estimated 16,000 lakes in Sweden have been severely affected by acid rain. In Canada, more than 150,000 lakes have been similarly affected. Officials in both countries claim that much of the damage is caused by pollution from other countries. Scientists believe that acid rain also damages forest ecosystems. Excess acids leach nutrients from forest soils and impair the ability of trees to use the remaining nutrients. Trees exposed to acid rain are often less resistant to disease and have discolored needles and leaves. This is a problem particularly in high altitudes, where trees affected by acid rain are often stunted and unhealthy.

In the past twenty years, acid rain has emerged as a controversial international problem among industrialized nations. Germans, who have grieved over the destruction of much of their famous Black Forest, claim that more than half of its acid rain originates elsewhere. Likewise, Canadians point out that the amount of acid rain they receive from the United States is up to four times more than the amount that the United States receives from Canada. Recently, the two neighbors agreed to stricter measures to reduce sulfur emissions.

Greater concern about acid rain has led many industrialized countries to control sulfur oxide pollution by promoting the use of scrubbers in coal plants and other new technologies. In the developing world, however, increased industrialization and automobile use threatens to extend the problem of acid rain to even more areas.


Defoliation in coniferous forests
Percentage of defoliated trees
no data
0-20
20-40
40-60
60-80
Note:
results include defoliation and discolouration
for Luxembourg and the German Democratic Republic;
results for Belgium, Italy, Yugoslavia and the
Soviet Union are based on regional surveys;
only trees less than 60 years of age were
assessed for Ireland;
only trees more than 60 years of age were
assessed for Austria and Italy (Bolzano)

As this map indicates, acid rain has damaged forests in most of Europe. (Data from *Forest Damage and Air Pollution*, ECE/Convention on Long-Range Transboundary Air Pollution/GEMS 1988. Reprinted courtesy of the United Nations Environment Programme.)

Deforestation and desertification

Since ancient times, people have cleared away trees for agriculture and settlements. The great civilizations of the Mediterranean world devastated the woodlands of the region. The forests of Great Britain are one tenth of the size of the forests that existed there 3,000 to 4,000 years ago.

While forests have actually expanded somewhat in Europe and North America over the past century, the problem of deforestation has grown more intense in many underdeveloped countries. In areas where rainfall is scarce -- one third of all land in the world -- clearing forests has left land in danger of becoming desert. These two processes -- deforestation and desertification -- are closely linked. The root structure of trees holds soil in place and provides nutrients for ground cover. Clearing away trees leaves soil exposed to the full force of rain and wind. Poor farming practices and short-sighted irrigation methods also lead to soil erosion. Livestock further degrades the land by eating young plants and leaving behind hard-packed trails and gullies.

Every year, approximately 70,000 square miles of land are damaged beyond agricultural use. In the 1930s, grasslands of the American Great Plains that had been plowed up during the previous decade were turned into a dust bowl by drought. Today, productive land is being lost to desert primarily in Africa, where 26 percent of the continent is undergoing some form of desertification. At the same time, tropical forests are suffering as well. In Brazil, which contains 26 percent of the world's tropical forests, trees have been cleared in the Amazon River basin for cattle ranching, logging, and agriculture. Without a protective canopy of dense vegetation, tropical soils are quickly leached of their nutrients by heavy rains and the equatorial sun. Since tropical forests absorb much of the atmosphere's carbon dioxide and release large amounts of carbon dioxide when burned, their loss could speed up the pace of global warming.

Decline of biodiversity

As humanity has moved into areas that were once wilderness, the rate of extinction among plants and animals has rapidly increased. Some biologists predict that the earth may lose one fifth of its existing species in the next 20 years. Any loss of biodiversity -- the range of life on the planet -- is beyond human power to replace. Potential sources for new medicines and technologies are also lost.

Concern for preserving biodiversity centers particularly on areas that are rich in wildlife, such as tropical rainforests. Although tropical rainforests cover only six percent of the earth, they contain over half the world's species. These areas have been stripped of their trees at an accelerating rate. Every year, more than forty million acres of tropical rainforest -- an area the size of Washington state -- are lost, as well as 4,000 to 6,000 tropical species. Other species-rich habitats are also endangered. Wetlands in the United States, Australia, New Zealand, and elsewhere have been damaged by industry and agriculture. Mangrove swamps, particularly in developing countries, are vanishing. Fisheries in the United States and Canada report a loss of freshwater fish species in North America.

Environmental organizations in developed countries have been largely responsible for laws protecting endangered species. Beginning in the 1970s, the United States took the lead in adopting environmental legislation. The Alaska National Interest Lands Conservation Act of 1980 set aside an area larger than California to preserve Arctic wildlife. Protecting wildlife, however, has also sparked protest from industries, such as timber and energy, which are barred from entering protected areas.

Many developing countries, such as Rwanda and Kenya in Africa, are attempting to protect wildlife by expanding their parks and preserves, particularly areas that contain species popular with tourists. The celebrated work of Jane Goodall, Dian Fossey and other scientists on African primates has resulted in stricter laws to protect the habitat of chimpanzees and mountain gorillas. In parts of Africa, however, poor, struggling countries have had trouble in maintaining preserves and enforcing anti-poaching regulations.

The Human Factor and Environmental Problems

Population growth

The development of agriculture 5,000 to 8,000 years ago set the stage for a gradual increase in human population. In ancient times, it took 2,000 years to double the population of the world. Since 1900, though, the world population has more than tripled.

Europe's population grew rapidly during the 18th and 19th centuries, while population growth in much of Asia, Africa, and Latin America has accelerated during the 20th century. Improvements in sanitation, medicine and food production have all contributed to the decline in death rates. At the same time, new agricultural techniques have enabled many countries to significantly increase their food production.

The current population of the world is 5.4 billion.

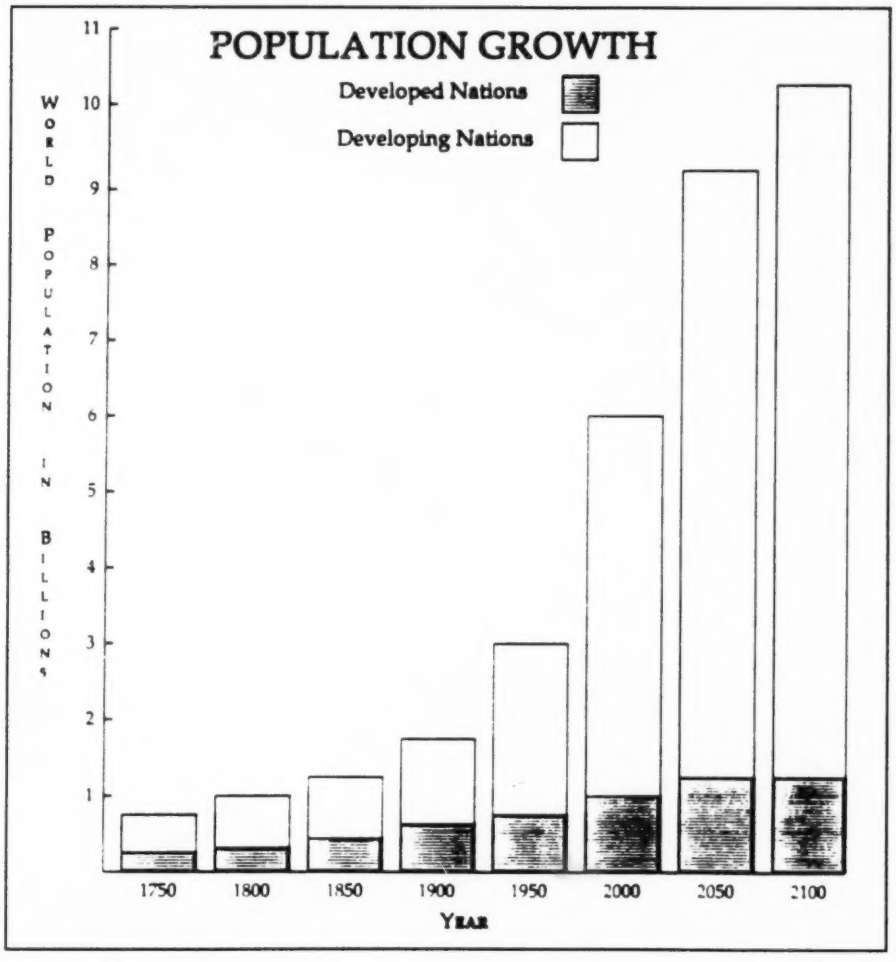
One billion people are added every ten years. Almost 95 percent of this growth is occurring in developing countries. Population figures alone, however, are only part of the story concerning humanity's impact on the environment. Perhaps equally important are rates of consumption by people in different parts of the world. In the developed world, where there is little population growth, people use a much greater proportion of the world's resources than their counterparts in developing countries. For example, an American uses 36 times more commercial energy (energy that is produced and sold) than an Indian.

Industrialization

Understanding the division between the industrialized, or developed, world and the non-industrialized, or developing, world is critical to the discussion of global environmental problems.

For most developed countries of the world, such as the United States, Japan, and the nations of Western Europe, industrialization has raised living standards to levels previously unknown in human history. For many developing countries, industrialization has become a goal. Billions of people in these countries hope to one day enjoy a lifestyle often taken for granted in the United States. For the planet as a whole, however, industrialization has fundamentally changed the relationship between humanity and the environment. If the developing world were to follow the pattern of industrialization pursued by wealthy nations over the past two centuries, scientists fear that the earth would be unable to support the increased level of consumption.

Many of the environmental problems associated with industrialization are caused by the use of fossil fuels. In the 17th century, the major energy source for England was wood. But with the onset of industrialization in the late 1700s, most forests were cleared and coal was increasingly used to meet the country's evergrowing appetite for fuel. In the 1800s, coal mining was expanded and oil-drilling techniques were developed. By the turn of the century, the United States had taken the lead in forging an industrial economy powered by coal and oil.



Although population growth in developed countries has leveled off, the number of people in developing countries is expected to increase rapidly until the middle of the 21st century. (Data from *Population Bulletin*, vol. 42, no. 2.)

Today, these two fossil fuels, along with natural gas, supply 88 percent of the world's energy needs. As countries in the developing world have taken steps toward industrialization, they too have drawn up plans based on fossil fuels.

The availability and versatility of fossil fuels have earned them a prominent place in the

modern world. Petroleum products, for example, can provide heat, generate power, and fuel vehicles. However, oil contributes to air pollution and global warming by releasing greenhouse gases and other pollutants. Americans are particularly dependent on oil. Although the United States is the second leading producer of oil in the world, consumption far exceeds production. In 1989, U.S. petroleum usage for transportation alone exceeded the total production of oil in the United States by 42 percent. Coal, which produces more pollution than other fossil fuels, has an even closer relationship with industrialization. The world has more coal reserves than oil or natural gas. Coal's relatively low cost has also made it attractive for poor countries on the road to industrialization. China, for example, generates 76 percent of its commercial energy from coal, making it the third largest contributor of carbon dioxide emissions -- behind the United States and the former Soviet Union.

The Industrial Revolution has also reshaped the nature of agriculture. New varieties of plants and improvements in technology have allowed farmers to expand the land area under cultivation worldwide by 450 percent in the past 300 years. Farmers today, even in developing countries, often rely on gasoline-powered vehicles and agricultural chemicals. These changes in the countryside have led to higher emissions of greenhouse gases. As more and more wilderness has been used for cattle ranching and rice paddies, the amount of methane gas in particular has increased worldwide. Methane gas is produced by bacteria in the stomachs of livestock and in the soil of rice paddies. Other sources of methane include landfills, swamps, mining, and leaking gas pipelines. Although methane molecules last for only seven to ten years (compared to 500 years for carbon dioxide), methane retains heat in the atmosphere more efficiently than carbon dioxide. Concentrations of methane in the atmosphere are increasing at four times the rate of carbon dioxide. Scientists estimate that methane accounts for between 12 to 20 percent of global warming.

Dilemmas of Economic Development

Different regions, different problems

Concern about the environment is a new phenomenon for most of the world. Throughout most of the 19th and 20th centuries, leaders in the developed world paid little attention to the long-term consequences of industrialization. European countries competed to establish colonies abroad, eager for abundant supplies of raw materials and new markets for their manufactured goods. By the turn of the century, almost all of Africa and much of Asia were under the control of Great Britain, France and other European powers. Although most of the colonies gained independence after World War II, these countries continued to provide raw materials for the factories of Europe while serving as markets for manufactured goods. The economies of the United States and Latin America were similarly linked.

Today, the relationship between the colonial past, economic development, and the environment has emerged as a pressing issue. Although each country has responded differently to these problems, observers have divided the nations of the world into four broad categories according to their economic and environmental concerns.

The developed world consists of the most advanced industrialized nations, including the United States, Japan, and Western Europe. The developed world consumes the bulk of the world's resources, while producing more than half of the world's wealth. In the process, the developed world has been primarily responsible for the pollutants that contribute to global warming, ozone depletion and acid rain. The United States alone is responsible for 20 percent of the world's carbon dioxide emissions.

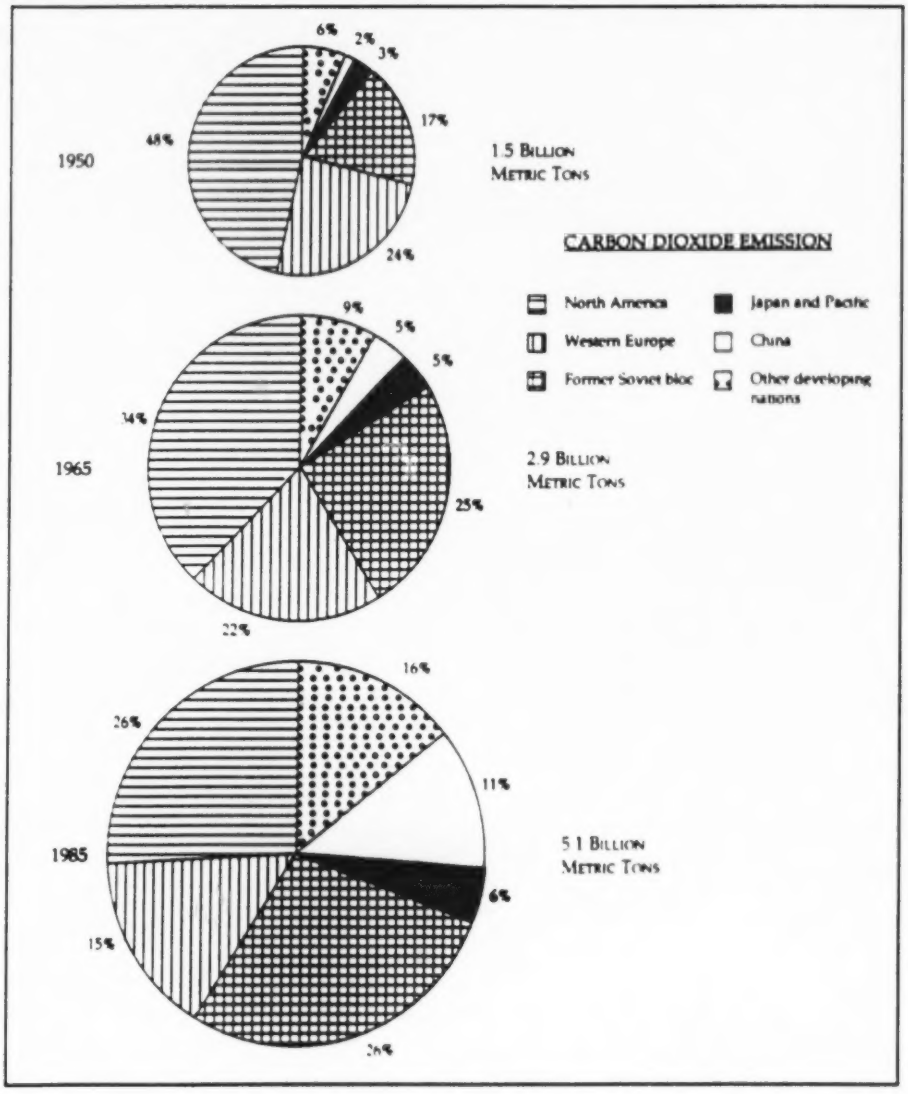
As the area that industrialized first, the developed world has experienced many of the planet's worst environmental problems. Coal use in Great Britain, for example, left many of the country's cities black with soot and led to severe health problems. As late as 1952, smog was responsible for the deaths of more than 4,000 people in London. In recent decades, however, successful efforts have been made to reduce the severity of air and water pollution problems throughout the developed world.

The former Soviet bloc -- mainly the countries of the former Soviet Union and Eastern Europe -- suffers from many of the worst features of industrialization. Under communism, the former Soviet bloc underwent a crash program of industrial development. Although progress was achieved in heavy industry, these countries failed to reach the prosperity found in the developed world. They also lacked the means to clean up many of their most serious environmental problems.

Much of the former Soviet bloc relies on poor-quality,

high-polluting coal and backward, energy- inefficient technologies that contribute to air pollution and global warming, and cause health problems. Leaks from the network of natural gas pipelines in the region emit methane. Leaded gasolines are still used in much of the former Soviet bloc. In Bulgaria, for instance, the government has adopted regulations on lead emissions recommended by the developed nations of the European Community, but most Bulgarian companies have so far been unable to meet the standards. Nuclear power facilities pose a threat of severe, lasting environmental damage in much of the former Soviet bloc. The explosion within a nuclear reactor at Chernobyl in the former Soviet Union in 1986 heightened fears about more than a dozen similarly designed facilities.

Newly industrializing countries consist mostly of nations in Asia and Latin America that have embarked on economic programs emphasizing rapid industrial development. Success stories for this approach include South Korea and Taiwan. Other countries, such as Mexico, China, India, and Brazil, are pursuing a similar course. Many of these countries have made progress in curbing population growth and are now anxious to catch up with the developed world. In the process, they have turned largely to fossil fuels to transform their societies and are increasing their emission of greenhouse gases.



Carbon dioxide emissions more than tripled between 1950 and 1985, increasing at a particularly rapid rate outside of North America and Western Europe. (Data are from the World Resources Institute.)

In many cities of newly industrializing countries, pollution rivals the worst period of industrialization in the United States and in Europe. Cities like Jakarta, Indonesia and Calcutta, India suffer from thick smog caused primarily by the burning of poor-quality coal and organic matter. Many developing nations, such as Mexico and Brazil, have increased their use of private cars but lack fuel efficiency standards and air quality regulations. In March 1992, Mexico City experienced record levels of smog and was forced to enact emergency measures. Children were kept home from school and factories were required to cut production by 50 percent.

The underdeveloped world consists of the poorest countries of the world, located mostly in Africa and South Asia.

Environmental problems in the underdeveloped world are caused less by industrialization than by growing numbers of people struggling for survival. Despite foreign aid, famine and disease are common in these countries. Since the population of many underdeveloped countries is rising rapidly, pressure on resources will continue to mount. Deforestation, desertification and declining biodiversity are widespread, as more and more people rely on the land for food and fuel.

The past two decades in the Sahel region of Africa have tragically illustrated the crisis facing much of the underdeveloped world. The Sahel is an arid region located on the southern fringe of the Sahara desert. Abundant rainfall in the 1950s and 1960s led to increased farming of high-priced export crops, such as peanuts. People moved from areas in the south to cultivate crops in northern areas of the Sahel that had not been farmed for centuries. As more and more land was used for export crops, less land was available to grow basic staples and graze livestock. The over-cultivation and over-grazing in this fragile area robbed the soil of nutrients and led to erosion. When a stubborn drought began in the early 1970s, the land was unable to support the people and animals. Tens of thousands of people in Ethiopia, the Sudan, and elsewhere in the Sahel have starved as a result. In addition, livestock herds have been decimated and productive land has been turned into desert.

Attitudes toward environmental issues

Wealthy, developed countries were responsible for placing environmental problems on the international agenda in the early 1970s. Today, many of these countries are attempting to address global environmental threats in international forums. Public opinion polls taken in Europe, Japan, Canada and the United States have found that people in these countries rank the health of the environment as one of the top five most important issues in the world.

The former Soviet bloc has only recently begun to focus on environmental problems. The Chernobyl disaster resulted in increased awareness of environmental problems and spurred the development of environmental organizations in many areas of the former Soviet bloc. Since the collapse of the Soviet Union, however, economic and political problems have overshadowed the environment. Former communist countries are attempting to adjust to a new political order and stimulate their stagnant economies.

Newly industrializing countries are also chiefly concerned with economic development. Many of these countries believe that wealthier countries should provide financial assistance to help industries adjust to new environmental concerns. China and India, for example, have insisted that developed countries provide assistance as compensation for their cooperation in phasing out technologies that use CFCs.

Countries of the underdeveloped world have likewise looked to wealthier countries to assist their development. Because of the dire conditions facing the underdeveloped world, many of these countries are more open to far-reaching global programs. Bangladesh, the islands of the Maldives, and other low-lying countries are particularly concerned that rising sea levels resulting from global warming may inundate their countries. Nonetheless, many in the underdeveloped world also fear losing control over their natural resources to wealthier countries. For example, underdeveloped countries want a share of the profits from new agricultural, medical and industrial products derived from species within their borders.

Questions for Consideration

Humanity's progress since the beginning of the Industrial Revolution has been remarkable, but the impact on the environment in many areas has also been substantial. How do you view the trade-off between the conveniences of modern life and the harm to the environment that has accompanied our progress? Which global environmental problems seem most threatening to you? What changes would you be willing to make in your lifestyle to address environmental concerns? These questions, of course, would be answered differently by people from other countries. How would you expect someone from China to view environmental problems? What about someone from Ethiopia? Finally, how much of the responsibility for global environmental problems falls on the shoulders of Americans?

Part II: Public Policy and the Environment

Countdown to the Earth Summit

In June 1992, leaders from more than 150 countries will take part in the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil. The governmental representatives will be joined by thousands of scientists and environmental activists to establish treaties on global environmental problems and chart a plan of action for the 21st century. The meeting, known as the Earth Summit, comes on the 20th anniversary of a UN conference in Stockholm, Sweden, that marked a breakthrough in international efforts to address global environmental problems.

In preparation for the Earth Summit, specific treaties on climate change and biodiversity are being negotiated, as well as a general statement on preserving the world's forests. Establishing international environmental policy, however, has been difficult. As in other arenas of international relations, individual countries have sought to promote their national interests at the preparatory sessions of the Earth Summit. Moreover, the gap between the developed and developing worlds has shaped environmental concerns and policy recommendations.

For instance, the United States, often with the support of Britain and Japan, has generally emphasized that developing countries have a responsibility to handle their own environmental problems, such as desertification, deforestation and industrial pollution. At Earth Summit negotiations, U.S. representatives have voiced concern that international laws on the environment would limit U.S. sovereignty and interfere with economic growth. Instead, the United States has emphasized the need for a free-market approach to environmental management and less governmental regulation.

Concern over the economic impact of proposed regulations has led the United States to oppose setting limits on the emission of greenhouse gases. Most other countries have come to a consensus in the area of climate change and favor a plan that would set emission limits and timetables, and provide developing countries with financial assistance to replace polluting technologies. The Japanese, for example, have agreed to contribute $1 billion to a new fund to promote sustainable economic development in poor countries.

As the Earth Summit approaches in June, the United States can expect to receive added pressure to sign the proposed treaty on climate change.

While most developing countries have supported limits on greenhouse gas emissions, economic development has remained their chief focus. Brazil, for example, has argued that the proposed treaty on biodiversity should not interfere with the right of developing countries to benefit from their own natural resources. Drafting a statement on the preservation of forests has also sparked controversy. Developing countries have claimed that developed countries, such as Canada and the United States, need to take stronger measures to protect their own temperate forests and not focus exclusively on preserving tropical rainforests. They note that vast areas of temperate forest in the former Soviet bloc have been cut with little regard for the environment.

On a broader level, the developing countries contend that the wide gap in the global distribution of wealth has to be considered along with environmental problems. They have consistently campaigned for increased funding and new technology from the developed world. Many of the poorest countries have been especially open to proposals for international environmental management. Faced with the most severe environmental and economic problems, these countries maintain that they can not afford to protect their environment without outside financial and technical aid.

The environment in the international arena

The Earth Summit represents a milestone for international involvement in environmental matters. Equally important, the Earth Summit helps to define a relatively recent issue in world politics.

The concept of global environmental concerns has emerged in the international arena only in the last few decades. For the first time in history, science and technology have given humanity the ability to reach virtually every spot on the globe -- from the deepest oceans to the polar ice caps. At the same time, countries in both the developed and developing world have come to recognize the trade-offs and limits of economic growth. As advances in technology and population growth have combined to change humanity's relationship with nature, environmental

issues have increasingly entered the domain of international relations.

Over the past few decades, the scope of international agreements on the environment has gradually broadened to cover areas of common concern to humanity. From treaties dealing with the use of the oceans, the international environmental agenda has expanded to include Antarctica, the atmosphere, and the ozone layer. Many environmental activists eventually hope to apply international agreements to the entire planet. Now that the oceans have been recognized as humanity's common heritage, these activists are pressing the international community to regard the world's forests, lakes, and other natural ecosystems in the same way.

As international environmental concerns have gained attention, however, international disputes have also arisen. The Convention on the Law of the Sea, for example, has been a source of disagreement. Countries with large fishing industries, such as Japan and the former Soviet Union, have often opposed measures to limit fishing or protect whales, dolphins, and other marine mammals.

Increasingly, controversy over use of the oceans has pitted countries of the developed world against newly industrializing countries which rely heavily on fishing. The United States and Mexico, for example, have found themselves in disagreement over Mexico's tuna fishing industry. In recent years, American environmentalists have forced the U.S. tuna industry to give up driftnet fishing -- a practice which efficiently catches tuna but also drowns thousands of dolphins. In 1989 and 1990, the tuna industries of Mexico and two other countries failed to meet U.S. standards for protecting dolphins. In response, the United States placed an embargo on their tuna. Mexico, though, has argued that the U.S. embargo obstructs free trade, and has won a favorable decision from the body that oversees international trade.

The United States has also been involved in the controversy over the international trade in hazardous waste disposal. As developed countries have tightened their own pollution laws, producers of hazardous wastes have turned to poor countries to find inexpensive dumping grounds. One of the most well-publicized examples occurred in 1988, when Nigerian authorities refused to accept a ship loaded with chemical wastes from Italy. Such incidents spurred poor countries to call for an international ban on the dumping of hazardous wastes beyond the borders of the source country. The United States, Japan, and several other developed countries, however, opposed a complete ban on international shipments of hazardous wastes. Instead, the agreement that finally emerged called for greater regulation. Neither the United States, which criticized the restrictions, nor many African countries, which advocated a total ban, have voiced enthusiasm for the treaty.

Debate over protection of the ozone layer has illustrated another dimension of the controversy over global environmental problems. The first agreement to limit production of CFCs was signed in 1987. Scientific evidence that ozone depletion was a greater threat than anticipated led to a stricter agreement in 1991. These measures called on developed countries to phase out CFCs and methyl chloroform by the year 2000. China and India, however, initially refused to sign the agreements. Both countries had invested in CFC technology as part of their plan to promote economic development. As an incentive to gain the participation of China, India, and other newly industrializing countries, a $240 million fund was created in 1990 to help developing nations shift to other technologies. Developing nations were also given an additional ten years to phase out ozone-depleting chemicals.

In 1992, further evidence of the destruction of the ozone layer resulted in still stricter measures. Germany, Denmark, and the Netherlands agreed to halt the production and use of ozone-depleting chemicals by 1994, the twelve-nation European Community by 1995, and the United States by 1996. Worldwide, CFC production has already fallen 40 percent since 1987.

The U.S. role

Although European countries have recently moved to the forefront of international efforts to address environmental problems, the United States can claim credit for supplying much of the early initiative.

Within the American public, concern over air and water pollution surfaced as an important political issue in the 1960s. The passage of the National Environmental Policy Act and the creation of the Environmental Protection Agency in 1970 served as a model for other developed countries. Public sentiment also prompted the United States to take a leading

MAP 2

The map shows signatories and accessions by July 1990 to the Vienna Convention for the Protection of the Ozone Layer (1985) and/or the Montreal Protocol on Substances that Deplete the Ozone Layer (1987), to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (1989), and to the eight regional seas conventions.

KEY

- ■ Vienna/Montreal, Basel and a regional seas convention
- □ Vienna/Montreal and Basel
- ■ Vienna/Montreal and a regional seas convention
- □ Vienna/Montreal only
- ■ Basel and a regional seas convention
- ■ Basel only
- □ Regional seas convention only

Vienna/Montreal, Basel and a regional seas convention

Bahrain
Chile
EC
Ecuador
France
Greece
Guatemala
Israel
Italy
Mexico
Netherlands
New Zealand
Nigeria
Panama
Spain
Syria
UAE
UK
USA
Venezuela

Vienna/Montreal and Basel

Argentina
Austria
Belgium
Canada
China
Denmark
Finland
German Democratic Republic
Germany, Federal Republic of
Hungary
Ireland
Jordan
Liechtenstein
Luxembourg
Norway
Philippines
Portugal
Sweden
Switzerland
Thailand
Uruguay
USSR

Vienna/Montreal and a regional seas convention

Australia
Cameroon
Congo
Egypt
Equatorial Guinea
Fiji
Ghana
Malta
Morocco
Peru
Senegal
Togo
Trinidad and Tobago
Tunisia
Yugoslavia

Basel and a regional seas convention

Colombia
Cyprus
Kuwait
Lebanon
Saudi Arabia
Turkey

Basel only

Afghanistan
Bolivia
El Salvador
Haiti
India
Poland

Vienna/Montreal only

Brazil
Burkina Faso
Byelorussian SSR
Chad
Iceland
Indonesia
Japan
Kenya
Malaysia
Maldives
Singapore
S Africa
Sri Lanka
Uganda
Ukrainian SSR
Zambia

Regional seas convention only

Algeria
Antigua
Barbados
Benin
Cook Islands
Côte d'Ivoire
Gabon
Gambia
Grenada
Guinea
Honduras
Iran
Iraq
Jamaica
Liberia
Libya
Madagascar
Marshall Islands
Mauritania
Micronesia
Monaco
Nicaragua
Oman
Palau
Papua New Guinea
Qatar
St Lucia
Seychelles
Solomon Islands
Somalia
Sudan
Tuvalu
Western Samoa
Yemen, Republic of

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role at the 1972 Stockholm Conference. U.S. attempts, however, to create an international environmental agency to set global standards did not succeed. Developing countries, in particular, suspected that efforts to reduce pollution would limit their control over their own natural resources and interfere with plans for economic growth. In the end, the Stockholm Conference produced a statement of principles that focused on the responsibilities of each nation to protect the global environment. Since then, there has been an increase in bilateral, regional and international agreements on environmental issues. However, given the lack of enforcement at the international level, these agreements have seldom been strictly observed.

Meanwhile, the U.S. position on environmental problems has shifted in international forums. The election of Ronald Reagan as president in 1980 brought a more conservative perspective on environmental issues to the White House. Both Reagan and President George Bush have sought to reduce governmental regulation of the economy. As a result, many environmental restrictions have come under scrutiny.

Americans have also indicated their reluctance to increase aid for developing countries. The aid question has taken on added significance in connection with the Earth Summit. Maurice Strong, the secretary general of the Earth Summit, has estimated that new environmental programs in developing countries would require $125 billion annually. Many developing countries have indicated their support for environmentally safe development, but emphasize the need for substantial assistance from wealthier countries.

The United States has shown little enthusiasm for environmental aid, especially in comparison with Western Europe and Japan. President Bush has agreed to contribute $50 million to a fund for global warming and $25 million to individual developing countries, but has rejected larger requests as unreasonable.

Since the end of the Cold War, U.S. policy on foreign aid has increasingly been the subject of re-evaluation. For more than four decades after World War II, the United States used foreign aid as a means to contain the spread of Soviet communism. Since the collapse of communism in the Soviet Union and Eastern Europe, countries that were once enemies have been competing with poor nations in the developing world for U.S. assistance.

In addition, the effectiveness of conventional economic aid has been called into question. Since the World Bank and the International Monetary Fund were created at the end of World War II, they have channeled U.S. economic aid to countries throughout the globe. Environmentalists, however, have pointed out that the World Bank has often overlooked environmental considerations and even contributed to ecological damage. A hydropower project in Brazil, for example, has caused extensive ecological damage in areas of the Amazon Basin.

Environment and Energy

Science and technology in the past two centuries have brought solutions to many of humanity's age-old problems. Advances in medicine have reduced the threat of deadly disease. Progress in agriculture and industry is winning the struggle against hunger and cold in much of the world.

Each step forward, however, has brought with it unforeseen consequences. When CFCs were invented around 60 years ago, they were hailed as a safe alternative to ammonia and other dangerous coolants used in refrigerators. No one imagined that the same chemicals posed a threat to the ozone layer. By the same token, the "green revolution" that transformed agriculture in much of southern Asia and Latin America in the last few decades has proved to be a double-edged sword. Reliance on chemical pesticides and fertilizers boosted crop yields, but also led to serious land and water pollution.

On an even broader scale, fossil fuel energy in the modern world has come to represent both a blessing and a curse. Without fossil fuels, industrialization would have been impossible, and yet these same sources of energy have largely been responsible for creating global environmental problems.

Increasingly, these problems have compelled government leaders, business executives, scientists, and citizens to look for a balance between pressures for economic growth and concern for the environment. Not surprisingly, energy has emerged as a central issue. Within this discussion, two topics stand out as most critical for the future: conservation and new technologies.

Conservation

Despite worsening environmental problems and

political turmoil in oil-producing areas of the Middle East, worldwide fossil fuel use has continued to rise. Rapidly industrializing countries account for much of the increase. By 2020, the developing world as a whole is expected to consume 40 percent of the world's fossil fuels, up from the current level of 28 percent.

In the developed world, fossil fuel use has held steady over the past two decades. Energy conservation has been the key factor. The major turning point came in 1973, when oil-producing Arab states cut off oil shipments to the United States to protest U.S. military aid to Israel. The embargo convinced the oil producers that higher prices could be maintained if they limited production. During the 1970s, the strategy worked. Oil prices soared from as low as $1 a barrel at the beginning of the decade to over $30 a barrel by 1979. Prices for other fossil fuels also increased.

In the United States and other developed countries, higher energy prices spurred new conservation measures in the 1970s. President Richard Nixon lowered the national speed limit to 55 miles per hour, consumers bought automobiles with better gas mileage, and industries improved fuel efficiency. Conservation efforts were accepted much as they had been during World War I and World War II. With the fall of energy prices in the past six years, however, progress on conservation has slowed. Gasoline prices are now comparable to prices before 1973. In recent years, Americans have been driving more and buying less fuel-efficient cars.

Meanwhile, Western Europe and Japan have continued to make strides in conservation. Germans and Japanese, for example, use half as much energy per person as Americans. Denmark, Finland and Sweden, have imposed "green taxes" to discourage fossil fuel emissions and support environmental programs. U.S. industry, which uses one third of the energy in the United States, also lags behind Western Europe and Japan in efficiency. Some experts recommend a system of government regulations, taxes and incentives to promote increased energy efficiency and recycling.

One proven method of boosting energy efficiency is cogeneration -- the simultaneous production of two different forms of energy. For example, cogeneration applies the waste heat from electric power generation to other uses, such as heating water. In the United States, the Gas Research Institute estimates that cogeneration is already responsible for reducing carbon dioxide emissions by eighty million tons every year. Many utility companies, however, fear that cogeneration would weaken the centralized control they exercise over the energy industry and undercut profits.

Aside from conservation, the world could reduce greenhouse gas emissions by substituting natural gas for oil and coal. Although natural gas is a fossil fuel, it produces much less pollution than oil or coal. Natural gas currently provides one fifth of the world's commercial energy, and usage could double by the year 2010. Worldwide reserves of natural gas exceed oil reserves. Much of the world's natural gas reserves, however, lies in remote, unspoiled locations.

Alternative technologies

Just as the expansion of fossil fuel use represented a technological breakthrough in the 19th century, new energy technologies are continuing to be developed and refined. Alternative technologies offer a vehicle for reducing our dependence on oil, coal, and natural gas, but each also raises questions of cost and feasibility.

Nuclear power, for example, was acclaimed as a source of clean, safe, inexpensive energy by many after World War II. Since then, experience with nuclear fission, which releases energy by splitting the nuclei of atoms, has raised concerns about the dangers of the radiation and nuclear wastes produced in the process. Currently, nuclear power produces about 12 percent of the world's electricity. Most of the world's nuclear power is produced by the former Soviet Union, the United States, France, Japan and Germany.

The explosion within a nuclear power plant at Chernobyl in the former Soviet Union focused greater public attention on nuclear power. The Chernobyl disaster forced 130,000 people from their homes in an area estimated to be 11,600 square miles. The relatively high cost of producing nuclear energy has also emerged as a concern at the official level. Sweden is phasing out nuclear power entirely, while Germany, Great Britain, and most Eastern European countries are cutting back their programs. Despite the dangers and the huge investment required for the construction of nuclear plants, nuclear power has gained support in many countries. France, for example, produces the most nuclear energy per capita in the world, meeting 75 percent of its electricity needs with nuclear power.

In the United States, President Bush has supported the increased use of nuclear power. Advocates of nuclear power note that fission does not produce greenhouse gases and argue that new technology has reduced safety risks.

Solar energy does not pose the safety problems associated with nuclear power and is virtually non-polluting. Since solar energy relies on the sun, it is also renewable. Currently, though, solar energy meets less than one percent of U.S. energy needs. Typically, solar power is collected through rooftop plates exposed to sunlight and then used to heat water or buildings. Solar energy is also increasingly being used to generate electricity, especially in the United States. Photovoltaic (PV) cells are a type of solar energy that convert sunlight directly into electricity. They were first developed for the U.S. space program and are currently used in calculators, watches and satellites. Presently, California produces more electricity from solar thermal power plants than the rest of the world. Advances in technology have made solar power less expensive than nuclear power for some California utility companies. Even so, critics argue that solar energy remains years away from competing with other energy sources in terms of price and reliability.

Renewable energy sources that are more widely used include hydropower (the use of rushing water to generate electricity) and biomass (the use of organic matter as fuel). Hydropower currently supplies 3.7 percent of U.S. energy and is also used extensively in Canada, the former Soviet Union, Brazil, Norway, China, and other countries with fast-flowing rivers. Hydropower accounts for one-fifth of the world's electricity production. In Norway, it generates 94 percent of electricity. The construction of large hydropower facilities, however, has often come under attack by environmental organizations because of the damage caused to surrounding ecosystems. Damming rivers not only floods large areas and destroys habitat for plants and animals downstream, but also cuts off the flow of rich sediments that replenish the soil.

In developing countries, biomass, mostly in the form of wood, supplies 35 percent of energy needs. Half the wood harvested each year is used by developing countries for cooking and heating. Currently, over two billion people rely on wood as their primary fuel source, and this number is rising rapidly. Deforestation in many poor countries, however, has reduced the supply of fuel wood and contributed to desertification. Many countries have launched efforts to replant forests, but most environmental experts agree that in the long run new energy sources are needed to preserve the forests. More promising for the future of biomass energy have been new techniques to produce methane gas and alcohols from organic matter. Methane gas produced from biomass is identical to natural gas. Proponents suggest that fast growing trees be planted specifically for producing methane gas. Sugar beets or corn could also be grown to produce ethanol, methanol, and other alcohols to fuel automobiles. Currently, ethanol is widely used in Brazil to power vehicles. Although cleaner than oil and coal, methane gas and alcohols nonetheless emit greenhouse gases.

Research is moving forward on other sources of energy as well. New technology has increased the efficiency of wind power from the earlier days of windmills. Currently, California's production of electricity from wind farms exceeds the production of the rest of the world. Geothermal energy from the heat of the earth's molten core is another potential source of power. The most common application of geothermal energy is producing electricity from hot springs. California produces one third of the world's geothermal power. Still other researchers are considering the possibility of harnessing ocean tides to generate energy.

Among the more experimental forms of energy, fusion has attracted the most attention. Fusion produces energy by forcing the nuclei of atoms together. This process results in much less radioactive waste than nuclear fission and no greenhouse gases. Like nuclear fission, fusion requires large, expensive, centrally run facilities that only produce electricity. While many scientists do not view fusion as a practical alternative for most of the world, proponents of fusion energy emphasize its cleanliness and potentially inexhaustible supply. They believe that electricity produced from fusion will eventually prove cheaper than other energy sources. Western Europe, Japan, and the United States have pursued fusion development most actively. In 1990, the United States invested $330 million in fusion research and development.

Although discussions about energy often focus on technical issues, the real debate involves choices of public policy. Each energy source, both existing and potential, has certain advantages and disadvantages. Coal, for example, is relatively plentiful and

inexpensive, but also contributes significantly to the build-up of greenhouse gases. Wind power, on the other hand, does not produce pollutants, but has yet to be seen as economically practical in most circumstances. As the United States and other countries consider future energy choices, decision-makers will be weighing the costs and benefits of each alternative.

The differences between the developed and developing world are also reflected in discussions about energy. Energy sources that produce huge amounts of electricity, such as nuclear power and, potentially, fusion, require expensive facilities and sophisticated networks to transmit electricity long distances. Many developing countries, however, lack the money to build new plants and extend their electrical grids to reach people in remote areas. More localized energy sources, such as those envisioned by advocates of solar energy, small hydroelectric projects, and wind power, can generate electricity on a smaller scale.

Questions for Consideration

The countries of the world have made important strides in addressing global environmental problems during the past two decades, but many areas of controversy have also emerged. How would you evaluate the accomplishments of the international community on environmental issues? What developments do you foresee in the coming years? What policies should the United States encourage in the international arena? Clearly, much of the future discussion on the environment will involve energy. Now that you have read about a wide variety of energy sources, what energy policy would you suggest for the United States? How do your thoughts about energy fit in with your other ideas about where the United States should be heading? How would your suggestions on energy policy work in other parts of the world?

Option 1

Putting the Economy First

Concern about the environment may be important, but for now the health of our nation's economy must assume top priority. That's what really touches the lives of Americans today. As a country, we must focus our attention on reinvigorating our economy in the competitive global market. At a time when the United States is struggling to shake off a stubborn recession, we can not afford environmental policies that will hamstring our economy. Thousands of American workers in the coal and timber industries have already lost their jobs because of environmental restrictions. These people should not be made to suffer in the name of a distant and uncertain threat, particularly while scientists continue to debate the meaning of confusing research data. In the future, when our economy is stronger and scientific data is more conclusive, we will be better able to tackle whatever environmental problems may arise.

The last few decades have shown that Americans will act responsibly to reduce pollution in our country. No one wants to destroy the ecology of his or her own backyard. The answer to environmental problems, however, does not lie in more governmental restrictions on people's lives -- especially restrictions imposed by international organizations. Americans have long proved that we can take care of our own problems. The rest of the world – including poor nations with skyrocketing populations and high-polluting industries – should also learn to act responsibly. More foreign aid or more power for international organizations will not solve their problems. For ourselves and citizens of other countries, we should continue to promote international free trade and economic growth. Whatever problems may be facing our country in the future, a United States that is economically vigorous will be able to respond more effectively.

What policies should we pursue?

- We should not sign international environmental agreements that limit U.S. authority over our own economic and environmental policies.
- We should ensure that measures to protect the environment at home do not interfere with economic growth.
- We should help industry rebound from the recession by relaxing burdensome environmental regulations – such as fuel efficiency standards that hinder the auto industry.
- We should minimize regulations on the development of fossil fuel resources and other energy technologies that enhance our energy security.
- We should continue to study global warming, ozone depletion, and other environmental concerns.

How would Option 1 affect us?

Under Option 1, the U.S. government would do little to interfere with the progress of industry. In areas where environmental restrictions have stifled the economy, regulations would be revised. The forces of the free market would be allowed to determine prices for energy. Oil, coal, and natural gas would continue to serve as our most important sources of energy over the next decade. Eventually, however, market forces would likely lead to improved technology and lower prices for renewable energies, such as solar power. In the short term, our lives would change little under Option 1. Pollution may increase, but some industries would benefit from relaxed environmental standards and provide more jobs.

PROS

Supporting Arguments:

1. Relaxing environmental regulations will give U.S. industries an opportunity to cut costs and bring our economy out of the recession.

2. By proceeding cautiously in response to the current sensationalism regarding environmental problems, the United States will avoid rash policy decisions and be in a better position to weigh ongoing scientific research.

&

3. Staying out of restrictive international environmental agreements will allow the United States to maintain control over its environment and economy.

4. By promoting economic growth, the United States will be in a better position in the long run to afford the costs of addressing problems at home, such as pollution.

CONS

Opposing Arguments:

1. By refusing to work with other countries on global environmental issues, the United States will find itself isolated from much of the international community.

2. Unless environmental problems are given high priority, U.S. science and industry will fall behind in an expanding field.

3. Neglecting environmental problems now will result in still greater harm to the health of both future generations and the planet as a whole.

4. Since the United States has the world's largest economy and is the world's leading polluter in many areas, any international plan to address global environmental problems will be doomed to failure without U.S. cooperation.

Option
2

Taking the Lead

As the most powerful nation in the world, the United States must lead the world in confronting the challenges of the 21st century. For 40 years, we competed with Soviet communism to maintain our leading position. That struggle ended in victory for the United States. Now environmental problems have emerged as an important issue, and once again the United States should be at the forefront. Our place in the world in the future may very well be determined by how we act today. Cleaning up the environment is already emerging as a key focus of science and industry. The nations of Western Europe and Japan recognize that new markets are opening up for environmentally sound products, and are moving quickly to develop innovative technologies. The United States cannot afford to lag behind in this field. Instead, we have an obligation both to ourselves and to the planet as a whole to take the lead in developing technologies that will protect the global environment. By acting decisively, not only do we provide a better world for future generations of Americans, but we ensure that the United States remains on the cutting edge of science and industry.

To accomplish our goals, the United States should avoid becoming entangled in the endless debates and discussions of international organizations. Rather, we should carry out our own program. Unfortunately, many of the problems affecting our environment are located far beyond our borders. Poor countries that chop down rain forests, dump sewage into the ocean, or run outmoded factories that pollute the atmosphere harm the health of the entire planet. Just as we have given poor countries aid to help them stop the expansion of communism, now we should use foreign aid to persuade countries to improve their environmental record. At home, the United States should invest in new technologies that will give us a jump in the growing market for environmentally sound products. In the competitive world of the 21st century, the United States cannot afford to be second best.

What policies should we pursue?

- We should invest in the research and development of environmental technologies -- especially in the area of renewable energy – that will be in demand internationally.
- We should provide tax breaks to U.S. industry to promote energy efficiency, recycling, and the use of alternatives to fossil fuels.
- We should grant favorable trading terms to countries that develop policies in line with U.S. environmental priorities while imposing trade sanctions on countries that violate environmental standards we favor.
- We should ensure that foreign economic aid is directed only to environmentally sound development projects that welcome U.S. environmental expertise.
- We should make sure that any new international environmental programs do not undercut our national interests.
- We should incorporate research on the environment into our national planning strategies, as we do now with economic data, and invest in satellites and other high-tech systems to monitor the environment.
- We should create a corps of environmental specialists to help poor countries curb pollution that threatens the global environment.

How would Option 2 affect us?

Under Option 2, the U.S. government would actively encourage the development of new technologies designed to cope with environmental problems. Solar, fusion, and other non-polluting energy sources would particularly benefit from government-sponsored research programs. Industries producing environmentally sound technologies would receive special tax breaks. In the short term, Americans would have to pay higher taxes to fund Option 2. In addition, stricter environmental standards would hurt a few high-polluting industries, lead to higher prices for some goods, and require that Americans stop driving old cars that still use leaded gasoline. Some companies would be unable to meet stricter standards, leaving workers unemployed. At the same time, though, the development of environmentally sound technologies would create new jobs.

PROS

Supporting Arguments:

1. Developing environmentally sound technologies will put the United States in the lead in a crucial field and help revive our economy.

2. Investing now to break our dependence on fossil fuels and promote energy efficiency will give U.S. industry a key competitive edge for the future.

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3. Just as we used foreign aid to guide countries away from communism, we can use foreign aid to compel countries to set responsible environmental policies.

4. The environment of the entire world will benefit from environmentally sound technologies developed by U.S. industry.

CONS

Opposing Arguments:

1. Because the causes and effects of many environmental problems are global, the countries of the world must work together to guarantee an effective response.

2. By acting alone in pursuing global environmental policies, the United States will offend our key allies and trading partners in the developed world that have already taken steps to address global environmental problems.

3. Pressuring poor countries to adopt environmental standards set exclusively by the United States will cause resentment and defiance.

4. With the U.S. economy struggling to recover from recession, we can not afford to suddenly change our energy policies and invest in unproven technologies.

Option 3

Sharing Environmental Leadership

Although the United States and other countries in the developed world have taken steps to curb pollution, the population growth and irresponsible development of many poor nations poses a mounting threat to the planet. Isolating ourselves from damage to the environment is not possible. Rather, environmental problems are of a global nature and can only be addressed cooperatively. We must join with other developed countries in seeking a solution. During the past decade, our partners in the developed world have taken a leading role in addressing the world's environment problems. The United States has lagged behind in environmental policies, but now we must wholeheartedly join our allies. In foreign policy, a new consensus has already emerged among the United States and the countries in Western Europe and Japan. Together, we defeated Iraqi dictator Saddam Hussein and coordinated efforts to help the countries of the former Soviet Union. By working as partners, countries of the developed world have not only achieved their goals more effectively but have equitably shared the costs among themselves. In today's interconnected world, international cooperation on environmental problems is essential as well.

In the end, only the developed countries have the technological know-how and the economic strength to restore the health of the planet. Poverty, overpopulation, and backward technologies have forced desperate people in poor countries to scratch out their existence with little regard to the environment. With the other developed nations, we should address the problems that lead to environmental destruction and oversee programs to implement environmentally responsible policies in poor countries. The countries of the former Soviet bloc, for example, require our guidance to prevent them from continuing the environmentally reckless course they charted under communism. At the same time, we must also accept our share of the burden for protecting the health of the planet by adopting stronger measures to protect the environment at home.

What policies should we pursue?

- We should join with other developed countries to strengthen international measures to control global environmental problems.
- We should encourage international lending agencies, such as the World Bank and the International Monetary Fund, to support only environmentally sound development projects.
- We should join with other developed nations to share the costs of carrying out environmental programs in developing countries.
- We should join with other developed nations to oversee the efforts of developing countries to research and manage their environmental problems.
- We should join with other developed nations to impose sanctions on countries that permit environmentally reckless development within their borders.
- We should join with other developed nations to establish a global environmental data program that would standardize environmental research worldwide.

How would Option 3 affect us?

Under Option 3, the U.S. government would strengthen regulations to clean up the environment in accord with the standards of other developed countries. We would speed up efforts to reduce carbon dioxide emissions and end the production of CFCs. Industries would receive tax breaks to help them adjust to new environmental standards. In the short term, Americans would have to pay higher taxes to fund Option 3. In addition, stricter environmental standards would harm some industries and leave workers unemployed, as well as lead to higher prices for some goods. Companies producing environmentally sound products, however, would prosper and expand. As individuals, we would also have to make small changes in our way of life, such as ending the use of CFCs, to keep in step with measures in other developed countries. At the same time, though, Americans would benefit from sharing the costs of cleaning up the environment with people throughout the developed world.

PROS

Supporting Arguments:

1. Cooperation among developed countries in pursuing the Persian Gulf war and coordinating aid to the former Soviet Union indicates that developed countries will effectively work together on environmental problems.

2. By setting aside part of their land for conservation in exchange for reductions in the debt they owe to developed countries, poor countries have shown that they are willing to cooperate with the developed world in protecting the environment.

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3. Now that the world is no longer divided by U.S.-Soviet rivalry, the developed world has a unique opportunity to forge a stable international consensus based on global environmental management.

CONS

Opposing Arguments:

1. Just as the Europeans and Japanese take advantage of U.S. policies promoting free trade, our allies in the developed world will use environmental cooperation to gain an unfair competitive edge.

2. The bureaucracy and regulations required to coordinate international environmental efforts will be one more strand of red tape holding down the growth of U.S. businesses.

3. Poor countries will refuse to cooperate if the developed world takes the lead in setting global environmental policies that hamper their development.

4. As the leader of the developed world, the United States will be expected to increase foreign aid for environmental programs at a time when we need the money at home.

5. With the Cold War over, maintaining close relations with Western Europe and Japan is no longer as important to our national security and should not be the driving force behind our environmental policy.

Option 4

Global Stewardship

With the survival of the planet at stake, global environmental problems outweigh national interests and must rank as the top priority on our national agenda. Other problems -- like recession, crime, and drugs -- are serious, but the looming environmental crisis threatens the very existence of humanity. Unless we make major changes in the way people live, we are headed for catastrophe. The United States and the other countries of the developed world are largely responsible for our current situation. The signs of environmental destruction that have emerged in the past few decades have alerted us that many of our basic assumptions must change. Our planet cannot survive the continued economic growth of developed countries and the desperate poverty of poor nations. Instead, we and the other countries of the world have to channel our technological resources toward creating a global economy that is environmentally sustainable for generations to come. Not only do we have to change our own lifestyles, but we must ensure that poor countries do not repeat our mistakes.

All countries -- rich and poor -- must have a voice in making our world a better place. Like never before in human history, the environmental crisis requires all people to work together for the good of our common earth. The United States can serve as a leading force for cooperation by fully supporting the role of the United Nations in charting global environmental policy. A new global outlook would mean giving up some of our sovereignty to international organizations and embracing countries of the developing world as partners in global decision-making. We should be ready to substantially increase aid to poor countries and accept changes in our personal lifestyles. Whatever the sacrifice, though, it's worth it. We are all citizens of the same planet, and we all have an obligation to safeguard the world for future generations.

What policies should we pursue?

- We should join with the international community to grant authority to the United Nations to establish strong international environmental laws and take part in enforcing global environmental standards.
- We should ensure that poor countries have an equal voice in developing global environmental policies.
- We should join in funding expanded international efforts to research environmental problems for global planning efforts and send teams of experts to deal with the most critical environmental crises.
- We should offer developing countries technology that will help them phase out high-polluting industrial processes.
- We should adopt decisions of the United Nations governing the environment as our own national laws.
- We should reduce the amount of resources we consume and shift our national priorities to create an economy that is environmentally sustainable.

How would Option 4 affect us?

Under Option 4, the U.S. government would introduce measures to restructure our economy based on environmentally sound principles. In cooperation with the other countries of the world, we would promote the development of industries that are capable of prospering in harmony with the environment. Industries that do not fit this plan would be phased out. The country would also move quickly toward cutting carbon dioxide emissions at least in half and developing non-polluting energy sources. In the short term, Americans would have to pay significantly higher taxes to fund Option 4. In general, our dependence on the gasoline-powered automobile would have to give way to reliance on cleaner forms of transportation. Many workers would also face unemployment, at least temporarily, as the economy shifts toward sustainable growth. In addition, prices would rise on many goods. Eventually, though, the economy would adjust, as industries become more energy efficient and produce more environmentally sound goods. More importantly, Americans would benefit from a real improvement in the planet's environment and could look forward to better personal health as pollution decreases.

PROS

Supporting Arguments:

1. Considering that poor countries are home to more than 80 percent of the world's people, their full participation is essential if we are to solve global environmental problems.

2. Only by requiring Americans to change their way of life will we achieve improvements in the quality of our environment here at home.

3. A new level of international cooperation and attention is our only hope for addressing environmental problems that transcend national boundaries.

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4. Poor countries will be unable to address global environmental problems without substantial economic assistance from the developed world.

5. Developing an economy that safeguards the environment is, in the long run, the only way to ensure the future of humanity.

CONS

Opposing Arguments:

1. By turning over authority on environmental policy to international organizations, the United States will relinquish power to govern its own environment and sacrifice the freedom of its citizens.

2. Stringent new regulations and more government spending will drag down our economy for years to come.

3. Funding international environmental programs will be too expensive, especially at a time when our own economy is struggling.

4. Providing corrupt, inefficient governments in poor countries greater international influence and additional aid will do little to improve the environment.

5. U.S. industry, struggling to regain its competitive edge, will be reluctant to develop new environmentally sound technologies that would be shared with other countries.

6. Expanded international efforts to regulate the environment will foster the same corruption and inefficiency associated with big government programs throughout the world.

Five-Day Lesson Plan

DAY ONE

Ozone depletion and public policy

Objective: This discussion activity encourages students to consider the relationship between environmental problems and public policy.

1. Instruct students to read "New Data Highlights Threat to Ozone Layer." Ask them to suggest an appropriate U.S. response to the depletion of the ozone layer. Should this problem take priority over other issues? Have U.S. leaders given adequate attention to the issue of ozone depletion?

2. Instruct students to read "Addressing the Problem of Ozone Depletion." Ask them to assess international efforts to eliminate ozone-destroying chemicals. Does ozone depletion require greater governmental regulation? How should the United States respond to countries that do not reduce their use of ozone-destroying chemicals? What are the trade-offs to be considered in developing U.S. policy toward ozone depletion? How much should individual Americans be asked to sacrifice? Emphasize that even when the causes and effects of environmental problems are fairly well-established, developing public policy raises many controversial issues.

3. Instruct students to read "Options in Brief." Explain that each of the options summarizes a distinct viewpoint toward U.S. global environmental policy. Ask students to consider the problem of ozone depletion from the perspective of the four options. For example, how would the policy recommendations of an Option 2 supporter differ from those of an advocate of Option 4?

Homework: Students should read Part I of the background readings and complete "Study Guide -- Part I."

DAY TWO

Regional differences at the Earth Summit

Objective: This role play will help students consider how global environmental issues are perceived in different regions of the world.

1. Divide the class into four groups. Explain that students will represent different regions of the world participating in the Earth Summit scheduled to convene in Rio de Janeiro in June 1992. (For more background on the Earth Summit, see "Countdown to the Earth Summit," pages 9-12, in Part II of the background readings.)

2. Assign each group one of four regions: the developed world; the former Soviet bloc countries; the newly industrializing countries; and the underdeveloped countries. Instruct each group to formulate a brief presentation on the environmental problems and concerns of its region. For example, representatives of the newly industrializing countries should note that their people are beginning to suffer from the ill effects of industrial pollution and rapid urbanization. At the same time, though, they would be wary of environmental restrictions that would hamper their development and deny their people an opportunity to reach a standard of living comparable to the developed world. Students should base their presentations on the "Dilemmas of Economic Development" section, pages 6-8, in Part I of the background readings. A review of the location of the major countries in each region may also be useful.

3. Instruct each group to select a member to record the ideas of the group and a spokesperson to deliver the presentation. After the groups have given their presentations, ask students to analyze the viewpoints of the four regions. What are the major points of contention? What are the chief criticisms aimed at the United States? What is the likelihood of global consensus on environmental issues?

Homework: Students should read Part II of the background readings and complete "Study Guide -- Part II."

DAY THREE

Role playing the four options: organization and preparation

Objective: This two-day simulation will familiarize students with leading issues framing the debate on U.S. global environmental policy.

1. Inform students that they will participate in a simulation using the options and the background readings. Form four groups of three to four students. Assign an option to each group. The remainder of the class will serve as members of a presidential advisory panel to counsel President Bush on U.S. policy in preparation for the Earth Summit. (In smaller classes, other teachers or administrators may be invited to serve as members of the presidential advisory panel.)

2. Distribute "Presenting Your Option" to the four option groups and "U.S. Global Environmental Policy" to the advisory panel. Inform students that each option group will be called upon in Day Four to present the case for its assigned option to the advisory panel. Explain that option groups should follow the instructions in "Presenting Your Option." Note that the option groups should begin by assigning each member a role. (As an extra challenge, ask the groups to design a poster illustrating the best case for their option.) While the option groups are preparing for their presentation, members of the advisory panel should develop cross-examination questions for Day Four (see "U.S. Global Environmental Policy").

Homework: Students should complete preparations for the simulation.

DAY FOUR

Role playing the four options: debate and discussion

1. Organize the room so that the four option groups face a row of desks reserved for the presidential advisory panel. Explain that the simulation will begin with three-to-five minute presentations by the spokespersons of the option groups. Encourage spokespersons to speak clearly and convincingly.

2. Following the presentations, invite members of the advisory panel to ask cross-examination questions. Make sure that each panel member has an opportunity to ask at least one question. The questions should be evenly distributed among all four option groups. If time permits, encourage members of the option groups to challenge the positions of the other groups. During cross-examination, allow any option group member to respond. As an alternative approach, permit cross-examination after each option is presented.

3. Instruct members of the presidential advisory panel to fill out the first part of their "Evaluation Form" during the course of the period. The second part of the worksheet should be completed as homework.

Homework: Students should read each of the four options, then fill out "Focusing Your Thoughts," and complete "My Option Five."

DAY FIVE

Looking into the future

Objective: This exercise will allow students to evaluate their options in a personalized context.

1. Call on members of the presidential advisory panel to share their evaluations of the option groups. Which

arguments were most convincing? Which beliefs were most appealing? Review the beliefs in "Focusing Your Thoughts," noting the relationship between beliefs and options. Call on students to explain how their beliefs guided their responses in "My Option Five."

2. Inform students that they will be using their responses to "My Option Five" as the basis for writing a letter projected one generation into the future. Students should imagine that the recipient of their letter is their own teen-age child. They should also assume that the recipient of the letter shares many of their own questions about environmental issues. The opening salutation should be addressed "Dear Son/Daughter." Instruct students to begin the letter by summarizing the beliefs and policies of their option. The conclusion of the letter should explain how the proposed option will result in a better life for the next generation. (Students may be given the choice of working individually or in pairs.)

3. *Extra Challenge:* As homework, instruct students to write a letter based on their option to the editor of a local newspaper, a member of Congress, President Bush, or a presidential candidate. Suggest that students focus on issues related to the Earth Summit.

New Data Highlights Threat to Ozone Layer

On February 3, 1992, scientists representing the National Aeronautics and Space Administration (NASA) held a news conference to announce new findings about the earth's protective ozone layer. NASA officials reported that: "The probability of significant ozone loss taking place in any given year is higher than we believed before." Within two weeks of the announcement, government officials in the United States and Europe had taken stronger action to curtail the use of man-made chemicals that damage the ozone layer.

Why did the announcement about the ozone layer raise such concern? Much of the answer to that question lies in understanding the relationship between the ozone layer and life on earth.

The ozone layer was formed more than one billion years ago when oxygen began to build up in the atmosphere as a by-product of photosynthesis in simple forms of aquatic plant life. Over eons, oxygen molecules combined with single atoms of oxygen high in the atmosphere to create ozone, a form of oxygen with three atoms. The ozone acted as a shield in blocking out the sun's hazardous ultraviolet rays and allowed more complex life to develop. Ozone continues to be created naturally, but the rate of production is balanced by other natural processes which remove ozone.

Since the 1970s, research has shown that chemicals used in refrigeration, air conditioners, aerosols, foam insulation, upholstery, packing material and other products are eating away at the ozone layer. Once ozone-destroying chemicals are released into the atmosphere, they remain active for about 100 years. As the ozone layer grows thinner, higher doses of ultraviolet radiation are expected to increase rates of skin cancer and cataracts, impair the body's immune system, and harm plants.

The findings announced by NASA in February were the first to indicate that populated areas in the Northern Hemisphere may face an immediate danger from ozone depletion. Some scientists predict that a hole could soon open up in the ozone layer over northern Europe, Russia, Canada, and the northern United States.

The NASA report prompted leaders in Western Europe to call for a quicker ban on the use of chemicals that harm the ozone layer. Germany, Denmark, and the Netherlands announced the toughest deadlines. They intend to halt the production and use of such chemicals by the end of 1994. The United States also moved up its deadline for eliminating ozone-destroying chemicals to 1996. Industries in Western Europe and the United States account for over half the world's production of ozone-damaging chemicals.

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Addressing the Problem of Ozone Depletion

Concern over ozone depletion has led to important changes in industry during the past five years. When the first international agreement on protecting the ozone layer was signed in 1987, many business leaders complained that the measures would dramatically increase their costs and disrupt the economy. At the time, few alternatives to chlorofluorocarbons (CFCs) -- the most widespread ozone-destroying chemical -- were available for many industries.

By 1992, however, a 40 percent drop in the consumption of CFCs had been achieved. Under the pressure of the 1987 agreement, and a stricter accord in 1991, companies have developed substitutes for virtually every chemical that harms the ozone layer. In many cases, U.S. businesses have moved faster than the laws require. Hughes Corp., for example, has replaced CFCs with a chemical derived from lemon juice. Auto mechanics have taken the lead in persuading U.S. automakers to install devices that recycle CFCs from auto air conditioners. United Nations (UN) officials believe that developed countries will stop making almost all chemicals that harm the ozone layer by 1995 or 1997.

As efforts to eliminate ozone-destroying chemicals move forward, however, new questions have surfaced. Chemical company representatives caution that CFC use can not be brought to a total halt overnight. Heavy-duty refrigerators, for example, continue to rely on CFCs. An immediate ban on CFCs would mean that much of the world's food would spoil. Others fear that rushing to replace ozone-destroying chemicals may result in the introduction of replacements without adequate safety testing. Some of the alternatives to CFCs, for instance, are flammable and poisonous.

The economic dimension of the CFC problem is especially important in countries outside of the prosperous developed world. In the former Soviet Union and Eastern Europe, economic crisis has undercut concern for environmental issues. Likewise, consumers in China, India and other rapidly developing countries are eager for refrigerators, air conditioners, and other products that have long been beyond their means. Under the recent agreements, industries in these countries that have recently emerged to meet growing consumer demand would be expected to give up CFC technology.

Finally, some scientists are questioning the validity of NASA's recent findings on ozone depletion. They point out that natural factors, such as the eruption of the Mount Pinatubo volcano in June 1991 or warmer sea surface temperatures, may be more important than man-made chemicals in explaining depletion of the ozone layer.

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Options in Brief

Option 1 -- Putting the Economy First

Concern about the environment may be important, but for now the health of our nation's economy must assume top priority. That's what really touches the lives of Americans today. As a country, we must focus our attention on reinvigorating our economy in the competitive global market. At a time when the United States is struggling to shake off a stubborn recession, we can not afford environmental policies that will hamstring our economy. Thousands of American workers in the coal and timber industries have already lost their jobs because of environmental restrictions. These people should not be made to suffer in the name of a distant and uncertain threat, particularly while scientists continue to debate the meaning of confusing research data. In the future, when our economy is stronger and scientific data is more conclusive, we will be better able to tackle whatever environmental problems may arise.

Option 2 -- Taking the Lead

As the most powerful nation in the world, the United States must lead the world in confronting the challenges of the 21st century. Cleaning up the environment is already emerging as a key focus of science and industry. The nations of Western Europe and Japan recognize that new markets are opening up for environmentally sound products, and are moving quickly to develop innovative technologies. The United States cannot afford to lag behind in this field. Instead, we have an obligation both to ourselves and to the planet as a whole to take the lead in developing technologies that will protect the global environment. To accomplish our goals, the United States should avoid becoming entangled in the endless debates and discussions of international organizations. Rather, we should carry out our own program. By acting decisively, not only do we provide a better world for future generations of Americans, but we ensure that the United States remains on the cutting edge of science and industry.

Option 3 -- Sharing Environmental Responsibility

Although the United States and other countries in the developed world have taken steps to curb pollution, the population growth and irresponsible development of many poor nations poses a mounting threat to the planet. Isolating ourselves from damage to the environment is not possible. Rather, we must join with other developed countries in seeking a solution. During the past decade, our partners in the developed world have taken a leading role in addressing the world's environment problems. The United States has lagged behind in environmental policies, but now we must wholeheartedly join our allies. In the end, only the developed countries have the technological know-how and the economic strength to restore the health of the planet. Poverty, overpopulation, and backward technologies have forced desperate people in poor countries to scratch out their existence with little regard to the environment. With the other developed nations, we should address the problems that lead to environmental destruction and oversee programs to implement environmentally responsible policies in poor countries.

Option 4 -- Global Stewardship

With the survival of the planet at stake, global environmental problems outweigh national interests and must rank as the top priority on our national agenda. Other problems -- like the recession, crime, and drugs -- are serious, but the looming environmental crisis threatens the very existence of humanity. Unless we make major changes in the way people live, we are headed for catastrophe. The United States and the other countries of the developed world are largely responsible for our current situation. We and the other countries of the world have to channel our technological resources toward creating a global economy that is environmentally sustainable for generations to come. Like never before in human history, the environmental crisis requires all people to work together for the good of our common earth. A new global outlook would mean giving up some of our sovereignty to international organizations and embracing countries of the developing world as partners in global decision-making.

Name: _____

Study Guide -- Part I

1. Summarize the causes and effects of each of the following problems:

Global warming

Ozone depletion

Acid rain

Deforestation and desertification

Decline of biodiversity

2. Why are most global environmental problems linked to industrialization?

3. Summarize how people in the four major regions of the world view environmental problems.

Developed world

Former Soviet bloc

Newly industrializing countries

Underdeveloped world

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Name:_____

Study Guide -- Part II

1. Which areas of negotiation do you expect to be most controversial at the Earth Summit?

2. How has the U.S. stance on international environmental issues changed over the past twenty years?

3. Why is energy a key factor in the discussion of environmental problems?

4. What changes in energy policy would you suggest to improve the environment?

5. What would be the drawbacks of your suggested changes? Consider people in both developed and developing countries.

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Presenting Your Option

Day One -- Preparing Your Presentation

Your Assignment: Your group has been called upon to appear before a panel that will advise President Bush on U.S. global environmental policy in preparation for the Earth Summit in June 1992. Your assignment is to persuade panel members that your option should be the basis for U.S. policy. You will be judged on how well you present your option.

Organizing Your Group: Each member of your group will take a specific role. Below is a brief explanation of the responsibilities for each role.

1. *Spokesperson:* Your job is to explain the option of your group to the presidential advisory panel in a three-to-five minute presentation. In preparing your presentation, you will receive help from the other members of your group. You should include arguments from their areas of expertise. Keep in mind, though, that you are expected to take the lead in organizing your group. Read your option and review the background readings to build a strong case for your option.

2. *Environmental Scientist:* Your job is to advise the spokesperson of your group on why your option is scientifically sound. As a scientist, you are familiar with the causes and effects of environmental problems. Carefully read your option, and then review the sections of the background readings that deal with your area of expertise. Pay special attention to the sections entitled "Our Planet and the Environment" (Part I, pages 1-4) and "Environment and Energy" (Part II, pages 12-15).

3. *Domestic Policy Analyst:* Your job is to advise the spokesperson of your group on how the policies of your option would address problems here at home. You should concentrate on assessing the effects of your option on our domestic environment and economy. Carefully read your option and then review the sections of the background readings that deal with your area of expertise. Pay special attention to the sections entitled "The Human Factor and Environmental Problems" (Part I, pages 4-6) and "Environment and Energy" (Part II, pages 12-15).

4. *Foreign Policy Analyst:* Your job is to advise the spokesperson of your group on why the policies of your option would address our foreign policy concerns. You should concentrate on assessing the effects of your option internationally, particularly in regard to our country's role in the world. Carefully read your option and then review the sections of the background readings that deal with your area of expertise. Pay special attention to the sections entitled "Dilemmas of Economic Development" (Part I, pages 6-8) and "Countdown to the Earth Summit" (Part II, pages 9-12).

Day Two -- Making Your Case

On Day Two, your spokesperson will deliver a three-to-five minute presentation to the presidential advisory panel. Notes can be used, but the spokesperson should speak clearly and convincingly. During the other presentations, you should take notes to prepare challenging cross-examination questions. After all of the groups have presented their options, members of the advisory panel will have the first opportunity to ask cross-examination questions. Any member of your group may respond during the cross-examination period. If time permits, your teacher may also allow you to challenge other option groups with your cross-examination questions.

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U.S. Global Environmental Policy

Presidential Advisory Panel Members

Your Role

You have been selected to serve on a select panel that will advise President Bush on U.S. global environmental policy in preparation for the Earth Summit in June 1992. As you know, scientists in the past few decades have come to recognize that a new set of environmental issues has emerged. Problems such as global warming and depletion of the ozone layer affect the entire planet. These concerns have lately entered the domain of international relations. As you also know, the past five years have witnessed dramatic changes on the world stage. The collapse of communism brought an end to the Cold War between the United States and the former Soviet Union. New possibilities for international cooperation have arisen, while at the same time new challenges and new requests for U.S. assistance have also surfaced. In this exercise, you should take all of these factors into account as you consider four different approaches to U.S. global environmental policy. What you decide will play a key part in shaping the U.S. role in the world as our country enters the 21st century.

Your Assignment

While the four option groups are organizing their presentations, you should prepare two questions regarding each of the options. You may develop your questions with another member of the advisory panel. Your teacher will collect these questions at the end of the exercise.

Your questions should be challenging and critical. For example, a good question for Option 1 might be:

> *If the United States adopts Option 1, how would our relations with Western Europe and Japan be affected?*

After all four option groups have completed their presentations, your teacher will call on you and your fellow panel members to ask questions. The Presidential Advisory Panel Members Evaluation Form is designed for you to record your impressions of the option groups. Part I should be filled out in class after the option groups make their presentations. Part II should be completed as homework. After this activity is concluded, you may be called upon to explain your evaluation of the option groups.

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Name:_____

Evaluation Form

Presidential Advisory Panel Members

Part I

What was the most persuasive argument presented in favor of this option?	What was the most persuasive argument presented against this option?
Option 1	*Option 1*
Option 2	*Option 2*
Option 3	*Option 3*
Option 4	*Option 4*

Part II

Which group presented its option most effectively? Explain your answer.

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Focusing Your Thoughts

Instructions: You have had an opportunity to consider four options on U.S. global environmental policy. Now it is your turn to look at each of the options from your own perspective. Try each one on for size. Think about how the options address your concerns and hopes. You will find that each has its own risks and trade-offs, advantages and disadvantages.

Beliefs

Considering the statements below will help you answer the first three questions of My Option Five. Rate each of them according to your personal beliefs:

1 = Strongly Support 3 = Oppose 5 = Undecided
2 = Support 4 = Strongly Oppose

___ To solve global problems, rich and poor countries must work together.

___ As the most powerful nation in the world, the United States is capable of addressing international problems without relying on other countries.

___ The United States should not allow other countries to shape policies that affect the lives of Americans.

___ Countries that are poor and technologically backward have only themselves to blame.

___ The United States has a responsibility to share science and technology to help solve the most pressing problems in poor countries.

___ The health of the U.S. economy has a greater impact on the lives of Americans than any other issue.

___ The United States needs the help of Western Europe and Japan to deal with international problems.

___ Poverty, lack of development, and corruption have left many poor countries unable to cope with critical problems within their borders.

___ In our competitive world, the United States can not afford to give up any advantage in science and technology.

___ Americans today need to make sacrifices in their way of life to safeguard the world for future generations.

Ranking the Options

Which of the options below do you prefer? Keep in mind that the beliefs you support most strongly should guide your choice. Rank the options, with "1" being the best option for the United States to follow.

___ **Option 1: Putting the Economy First**

___ **Option 2: Taking the Lead**

___ **Option 3: Sharing Environmental Leadership**

___ **Option 4: Global Stewardship**

Creating Your Own Option

Your assignment is to create an option that reflects your own beliefs and opinions. You may borrow heavily from one option, or you may combine ideas from two or three options. Or you may take a new approach altogether. There are, of course, no perfect solutions. And there is no right or wrong answer. Rather, you should strive to craft an option that is logical and persuasive. The "My Option Five" worksheet will help you organize your ideas.

Name:_____

My Option Five

1. How important are environmental problems compared to other problems facing the United States?

2. Which parts of the world pose the greatest threat to the global environment?

3. What changes, if any, should the United States make in our relations with other countries in response to environmental problems?

4. Summarize the option you think the United States should adopt regarding global environmental policy.

5. What are the two strongest arguments opposing your option?

   A.

   B.

6. What are the two strongest arguments supporting your option?

   A.

   B.

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Suggested Reading

Blackburn, Anne M. *Pieces of the Global Puzzle: International Approaches to Environmental Concerns.* Golden, Colorado: Fulcrum, 1986. 204 pages.

Carroll, John E., ed. *International Environmental Diplomacy: The Management and Resolutions of Transfrontier Environmental Problems.* New York: Cambridge University Press, 1988. 291 pages.

Goldfarb, Theodore E. *Taking Sides: Clashing Views on Controversial Environmental Issues.* 4th ed. Guilford, Connecticut: The Dushkin Publishing Group, Inc., 1991. 334 pages.

Gore, Al. *Earth in the Balance: Ecology and the Human Spirit.* Boston: Houghton Mifflin Company, 1992. 407 pages.

McKee, David L. *Energy, the Environment and Public Policy: Issues for the 1990s.* New York: Praeger, 1991. 220 pages.

Pirages, Dennis. *Global Technopolitics: The International Politics of Technology and Resources.* Pacific Grove, California: Brooks/Cole Publishing Company, 1989. 220 pages.

Silver, Cheryl Simon and DeFries, Ruth S. *One Earth One Future: Our Changing Global Environment.* Washington, D.C.: National Academy Press, 1990. 196 pages.

Simon, Julian L. and Kahn, Herman, ed. *The Resourceful Earth: A Response to Global 2000.* Oxford and New York: B. Blackwell, 1984. 585 pages.

World Resources Institute. *The 1992 Information Please Environmental Almanac.* Boston: Houghton Mifflin Company, 1992. 606 pages.

World Resources Institute, UN Environment Programme and UN Development Programme. *World Resources 1992-1993.* New York: Oxford University Press, 1992. 385 pages.

Worldwatch Institute. *State of the World 1992: A Worldwatch Institute Report on Progress Toward a Sustainable Society.* New York: W. W. Norton and Company, 1992. 256 pages.

Information on the environment is available electronically to subscribers of the ECONET *telecommunications services sponsored by the Institute for Global Communications. For more information on this service, write to* ECONET, *18 deBoom Street, San Francisco, CA 94107, or call (415) 442-0220.*

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FOLLOW-UP FORM: Please take a few moments to report on your use of this curriculum unit.

GLOBAL ENVIRONMENTAL PROBLEMS: IMPLICATIONS FOR U.S. POLICY

Alternatives for Public Debate and Policy Development

Date(s) used: Course in which you used it:

Grade and level of students:

Number of Students:

Did you use the lesson plans as they appear in the material or did you alter them? If so, how? What worked and what was less than perfect?

Were your students able to "try on" other perspectives?

Did your students find any of the Options especially appealing or unappealing? Why?

One of the goals of this unit is to encourage students to become more attentive to public policy issues. Do you have any evidence that this happened?

Other comments:

NAME_____ SCHOOL_____

ADDRESS_____CITY_____STATE____ZIP____

HOW DID YOU HEAR ABOUT THIS MATERIAL?_____

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